



Federal Communications Commission
Washington, D.C. 20554

January 19, 2012

Dean R. Brenner
Vice President, Government Affairs
Qualcomm Incorporated
1730 Pennsylvania Avenue, NW
Suite 850
Washington, DC 20006

Re: RM-11640

Dear Mr. Brenner:

Thank you for the November 30, 2011 presentation in RM-11640 dealing with Qualcomm's proposed Next-Gen Air-to-Ground system in the 14.0-14.5 GHz band. Staff has a number of follow-up technical questions to which a written response would be helpful.

The staff's questions are attached. We look forward to your response.

Please contact Howard Griboff (202) 418-0657) with any questions.

Sincerely,

A handwritten signature in blue ink that reads "James L. Ball". The signature is fluid and cursive.

James Ball, Chief
Policy Division

Federal Communications Commission

Attachment
Staff Questions

- (1) We understand your analysis assumes an even distribution of aircraft over the United States, suggesting that the results of your analysis are independent of the beamwidth of the Fixed Satellite Service (FSS) satellite antenna. That is, as the FSS satellite antenna beamwidth decreases and its sensitivity increases, there will be correspondingly fewer aircraft within the beam, so the levels of interference will remain constant. However, given that the distribution of aircraft is not uniform and the number of aircraft per square-mile can be significantly higher over certain airports, how will you compensate for this uneven aircraft distribution to ensure no FSS satellite receiver will receive more than the calculated interference?
- (2) Your analysis appears to assume that the satellite beams are non-overlapping. In reality, however, there is some out-of-beam energy collected by a satellite antenna. How will this additional interference affect the interference analysis you have provided?
- (3) The interference analysis indicated that 600 uplink beams, *i.e.*, 150 ground stations each with 4 uplink beams, would raise the noise temperature of a typical FSS receiver by the calculated amount. In the presentation of November 30, 2011, you stated that 150 ground stations was a preliminary estimate and the final number of ground stations would depend on the final network design and could be as high as 250. At your assumed rate of four uplink beams per ground station, what would the effect of a hard limit of uplink beams be on the Qualcomm system, for example, 600 or 1000 uplink beams?
- (4) If the final network consisted of 250 ground stations, how would Qualcomm limit the interference received by the FSS to the values calculated in your proposal?
- (5) Your analysis assumed a front-to-back ratio for Qualcomm's phased array ground station antennas of 37 dB (see Table A.8). Does this include grating lobes and other effects or is this an average?
- (6) What protection exists to prevent a ground station antenna from generating beams pointing in directions other than toward the northeast to northwest?
- (7) Is your interference analysis based on peak or average power? If it is based on average power, please inform us of your expected peak-to-average power ratio.
- (8) If your system were suspected of providing interference to an FSS receiver, how would you resolve the questions of identifying/eliminating the source of interference to the FSS receiver from an aircraft or ground station transmitter?